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MEMORANDUM

Date: March 19, 2014

To: Eric Schroeter
State Design Engineer

From: Kaskaskia Engineering Group on behalf of
Lee Hillner, P.E.
Transportation Project Manager

RE: MoDOT St. Louis District
Vehicle Detection Upgrade at Existing Signalized Intersections
Various Locations in St. Louis City, St. Louis County, St. Charles County, Franklin
County, and Jefferson County
J6S3075
Proprietary Items (Wavetronix – SmartSensor Advance)
Public Interest Finding Request
KEG No. 13-1013.00

I do hereby certify that in accordance with the requirements of 23 CFR 635.411(a)(2), no equally suitable alternate exists for this patented or proprietary item.


State Design Engineer

With respect to the above referenced project, we request approval of a finding in the public interest to use the wireless advanced vehicle detention equipment manufactured by Wavetronix.

This project includes upgrading existing traffic signals by adding advanced vehicle detection to monitor the dilemma zones at the high-speed intersection approaches where the signal timing plan is not coordinated (runs free). This detection will help provide for dilemma zone protection, as well as more efficient signal timing operations. The project includes 23 intersections at various locations throughout the City of St. Louis, St. Louis County, St. Charles County, Franklin County, and Jefferson County. This project includes the installation of equipment to utilize digital wave radar which allows for the continuous, real-time identification of individual vehicle approach speeds to determine the vehicles arrival time at the stop bar. The system processes that information and uses it to determine if the vehicle will be caught in the dilemma zone and extends the green time to allow for safe passage through the intersection if necessary. The system also monitors the traffic flow and determines gaps in the traffic flow, if present, to end the green time before the signal reaches its maximum green time.

Existing Wavetronix Equipment

There are various existing signalized intersections within the St. Louis District that currently utilize the SmartSensor system by Wavetronix for dilemma zone monitoring. For system consistency, training, and maintenance, the district needs to continue the installation of the Wavetronix

equipment throughout the district. Most recently, 25 free operating signalized intersections throughout Franklin County, Jefferson County, St. Charles County, and St. Louis County have had the Wavetronix equipment installed. Routes where the advance dilemma zone detection zone equipment are installed include: MO 100, US 50, MO 47, MO 21, US 67, MO 79, MO 94, and MO 109. The systems are performing as designed and the district staff has been trained for the operation and maintenance of this system. By installing the same Wavetronix equipment, the efficiency of the MoDOT roadway network will be maintained while improving intersection safety and operation at high-speed signalized intersections.

Discussion of Alternatives

Research of potential alternative systems indicates that other than the Wavetronix system, there is not a singular system which reasonably meets the current needs and requirements of the MoDOT advance dilemma zone detection at high-speed signalized intersections.

The traditional dilemma zone detection involves the installation of inductive loops in the roadway pavement at a fixed location from the stop bar. The location of the loops is determined based upon the expected travel speeds of the roadway users. The traditional inductive loop systems typically provide over-protection or under-protection of an approach since the fixed location loops exclude many vehicles from detection, which decreases the safety of the intersection. The loop detectors cannot detect vehicle travel speeds, which may increase or decrease as the vehicle approaches the intersection. Inductive loop systems may utilize a larger detection zone in order to address vehicle speed ranges but this may result in vehicles being over-protected and adversely affecting the operation of the intersection. Traditional loop systems also require the inductive loops to be installed into the pavement and over time, at locations with a significant heavy truck volume, the loops can shift in the pavement and result in a loss of detection. The pavement structure is compromised with the inductive loops being installed in the pavement as well.

Magnetometer systems are another alternative but does not meet the MoDOT requirements. The magnetometer systems provide detection at a single location and does not provide a wide detection area. The magnetometer systems also require that a magnetic sensor be installed in the pavement, which requires a short lane closure for installation and compromises the integrity of the pavement.

In conclusion, the magnetometer system and the inductive loop system does not meet the MoDOT requirements for advanced vehicle dilemma zone detection, including continuous, real-time detection. The Wavetronix system has been installed at numerous high-speed signalized intersections throughout the St. Louis District and they are operating satisfactorily. MoDOT staff has been trained for the operation and maintenance of the Wavetronix system.

No equally suitable alternative exists as available alternative products do not provide all of the required properties or capabilities. Therefore, the use of the SmartSensor advance dilemma zone detection system, manufactured by Wavetronix, is the appropriate option for this project. Approval

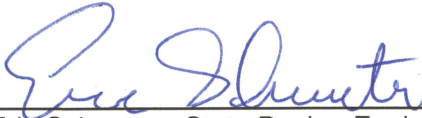
Mr. Eric Schroeter
Proprietary Items (Wavetronix – SmartSensor
Advance)

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of this request at your earliest convenience would be appreciated. This project is scheduled for a July 2014 bid opening.

Approved by:



Eric Schroeter, State Design Engineer

3/25/14
Date

